



ISSN: 0975-833X

## RESEARCH ARTICLE

### ICTHYO-FAUNAL DIVERSITY OF UTRA LAKE IN MANIPUR

\*<sup>1</sup>Ningthoukhongjam Indira Devi, <sup>2</sup>Ngasepam Romen Singh, <sup>1</sup>Chabungbam Bijayalakshmi Devi, and <sup>1</sup>Shomorendra, M.

<sup>1</sup>Fish Disease and Biotechnology Research Laboratory, Department of Zoology, Thambal Marik College, Oinam 795134, Manipur, India

<sup>2</sup>Department of Life Science and Bioinformatics, Assam University, Silchar-788011, India

#### ARTICLE INFO

##### Article History:

Received 25<sup>th</sup> September, 2014

Received in revised form

10<sup>th</sup> October, 2014

Accepted 18<sup>th</sup> November, 2014

Published online 30<sup>th</sup> December, 2014

##### Key words:

Mega diversity, Utra Lake, Manipur, Cypriniformes, Perciformes, Beloniformes.

#### ABSTRACT

Fish enjoys a very special consideration and place in human civilization from time immemorial. Fish is one of the most important sources of food. As India occupied 9<sup>th</sup> position in fresh water mega biodiversity. The study of Utra Lake in Manipur was carried out during March to September, 2014. A total of 42 Ichthyo-faunal species belonging to 32 genera under 15 families and 6 orders were reported during my study period. Order Cypriniformes has got maximum number of fish i.e.22 species wish is followed by Perciformes with 7 fish species and order Beloniformes with only 2 species. All the collected fishes were recognised as ornamental, commercial, aquaculture etc. Among these fishes most abundant fishes in Utra Lake are *Channa punctatus*, *Anabas testudineus*, *Glossogobius giurus*, *Trichogaster fasciatus* followed by *Esomus danricus* and *Channa orientalis* was least abundant.

Copyright © 2014 Ningthoukhongjam Indira Devi et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

#### INTRODUCTION

Fish is one member of a paraphyletic group of organisms that consist of all gill bearing aquatic craniates animals that lack limbs with digits. Fish are cold-blooded animal allowing their body temperature to vary as ambient temperatures change, though some of the large active swimmer like white shark and tuna can hold a higher core temperature. Fish are abundant in most bodies of water. They can be found in nearly all aquatic environments, from high mountain streams to deepest oceans. Fishes are the most important source of food and also play an important role in health and commercial values as many countries have been staple items of diet of many people in the world. Fishes constitute slightly more than half of the total number approximately 54,711 recognized living vertebrate species. The fishes are one of the main exploitable resources of the aquatic ecosystems that fresh fish flesh provides an excellent source of protein for human diet. Nutritional studies have proved that proteins rank in the same class as chicken protein and are superior to milk; beef protein and egg albumin. Fish proteins comprise all the ten essential amino acid in desirable strength for human consumption. Biodiversity is essential for stabilization of ecosystem, protection of overall environmental quality for understanding intrinsic worth of all species on the earth (Vijaykumar, 2008).

The objective of the study was to give recent data regarding fish diversity, aiming to contribute a better knowledge of the fish diversity of the Utra Lake of Nambol, Manipur. In this area various indigenous, ornamental and commercial fishes were found. Pioneering work on fish diversity in 19<sup>th</sup> century was of Misra (1962), Jayram(1981) and Talwar and Jhingran (1991).Utra lake locally known as Utra pat (Pat, a Lake in Manipur) which is situated in Nambol, Bishnupur District, at an appropriate distance of about 20km from Imphal. In the present study an attempt has been made to record the fish diversity from Utra Lake in Nambol, Bishnupur District, Manipur .The water is used mainly domestic purposes, irrigation, and fishing purposes record no earlier of fish fauna. It is shallow weed-infested lake cover with heterogeneous vegetation. The main threats of fishes of this lake are poisoning and habitat destruction.

#### Study site

Utra Lake is an old entropic wetland located at about 20 km on the south-west of Imphal in Bishnupur District. It is located between 24° 25' N-24° 40' N latitude and 93° 45'-93° 55' E and is situated above 783 m above the MSL. The total surface area of lake is about 36.6 ha. The maximum length and breadth of the lake are approximately 0.71km and 0.494 km respectively at FSL. The depth of the water varies from a minimum of 0.68 m to a maximum of 2.18 m and the average depth is 1.43 m. (Figure 6)

\*Corresponding author: Ningthoukhongjam Indira Devi

Fish Disease and Biotechnology Research Laboratory, Department of Zoology, Thambal Marik College, Oinam 795134, Manipur, India.

## MATERIALS AND METHODS

Topographically, Manipur is constituted by two distinct geographic features, i.e. an elevated central plain forming a valley and rows of mountains on all sides. While the valley rich Lakes, ponds and wetland, the mountain regions are drained by three systems, viz. The Barak River systems. The Manipur river system and Yu river system. Due to different geographical entity, the aquatic resources in the state exhibit diverse characteristics with immense Ichthyo-faunal diversity. This hilly state situated at the North-Eastern border of India as considerable aquatic resources situated for fishes. Monthly of fish were made from the side of collection (Utra Lake, Nambol, Bishnupur District, Manipur. The fish were collected from Nambol market. The collected fishes were identified; weight and length were taken (Francis Day 1878, 1889 and 1987; Jayram, 2010 and Vishwanath, 2002).

## RESULTS AND DISCUSSION

Fish being one of the main items of food for most people in Manipur, the demand for fish is very high in this area. About 90% of the people in the state are fish eaters. Utra Lake has rich diversity of 42 fish species belonging to 32 genera, 15 families and 6 orders. The observation indicated that the quality of water is within the favourable limits for fish and fisheries practices, the richness of fish is good, and the fishes belonging to Cyprinidae dominate the lake. Order Osteoglossiformes has got family Notopteridae, represented by fishes like *Notopterus notopterus* (Pallas, 1769).

Anguilliformes its family Anguillidae, represented by *Anguilla bengalensis* (Gray, 1831) Order Cypriniformes: Family Cyprinidae representative types *Hypophthalmichthys molitrix* (Valenciennes, 1844), *Amblypharyngodon mola* (Hamilton, 1822), *Barilius bendelisis* (Hamilton, 1807), *Esomus danricus* (Hamilton, 1822), *Bangana dero* (Hamilton, 1822), *Catla catla* (Hamilton, 1822), *Cirrhinus mrigala* (Hamilton, 1822), *Ctenopharyngodon idella* (Valenciennes, 1844), *Cyprinus carpio* Linnaeus, 1758, *Labeo rohita* (Hamilton, 1822), *Osteobrama belangeri* (Valenciennes, 1844), *Puntius sophore* (Hamilton, 1822), *Pethia manipurensis* (Menon, Rema Devi and Vishwanath, 2000), *Barbonymus gonionotus* (Bleeker, 1849) *Puntius meingangbi* (Arunkumar and Tombi Singh), *Puntius chola* (Hamilton, 1822), *Semiplotus manipurensis* Vishwanath and Kosygin, 2000, *Psilorhynchus balitora* (Hamilton, 1822) and Cobitidae family represents *Syncrossus berdmorei* Blyth, 1860, *Lepidocephalichthys guntea* (Hamilton, 1822, *Lepidocephalichthys irrorata* (Hamilton-Buchanan), *Schistura sikmaiensis* (Hora, 1921). Order Perciformes under family like Channidae contribute species like *Channa punctatus* (Bloch, 1793), *Channa orientalis* Bloch and Schneider, 1801, *Channa striata* (Bloch, 1793), *Parambassis ranga* (Hamilton, 1822) and *Chanda nama* Hamilton, 1822, Gobiidae has species like *Glossogobius giurus* (Hamilton, 1882), Cichlidae has got species like *Oreochromis mossambicus* (Peters, 1852), Anabantidae: *Anabas testudineus* (Bloch, 1972), and Belontiidae: *Trichogaster fasciata* Bloch and Schneider, 1801, Order Siluriformes under family like Bagridae has species like *Mystus bleekeri* (Day, 1877), *Mystus cavasius* (Hamilton, 1882), family Siluridae has species like *Ompok bimaculatus* (Bloch, 1794), *Wallago attu* (Bloch and Schneider, 1801), family Claridae has species like *Clarias batrachus* (Linnaeus, 1758) and family Heteropneustidae has species like *Heteropneustes fossilis* (Bloch, 1794) and Order Synbranchiformes fall under two family like Synbranchidae; *Monopterus albus* (Zuiew, 1793) and Mastacembelidae; *Mastacembelus armatus* (Lacepede, 1800).

**Table 1. Fish species diversity of ultra lake during april-september 2014**

IUCN RED LIST: DD: DATA DEFICIENT, LC: LEAST CONCERN, VU: VULNERABLE, NE: NOT EVALUATED, NT: NEAR THREATENED

Order	Family	S.No	Scientific name	Local Name	IUCN	Human use	Feeding habit	Threats to Human
Osteoglossiformes	Notopteridae	1.	<i>Notopterus notopterus</i> (Pallas, 1769)	Ngapai	LC	Commercial Ornamental	Omnivore	Harmless
Anguilliformes	Anguillidae	2.	<i>Anguilla bengalensis</i> (Gray, 1831)	Ngaril laina	NT	Ornamental Commercial	Omnivore	Harmless
Cypriniformes	Cyprinidae	3.	<i>Hypophthalmichthys molitrix</i> (Valenciennes, 1844)	Silver carp	NT	Commercial Aquaculture	Herbivore	Potential pest
		4.	<i>Amblypharyngodon mola</i> (Hamilton, 1822)	Muka nga	LC	Commercial Aquaculture	Herbivore	Harmless
		5.	<i>Barilius bendelisis</i> (Hamilton, 1807)	Ngawa	LC	Ornamental Commercial	Herbivore	Harmless
		6.	<i>Esomus danricus</i> (Hamilton, 1822)	Ngasang	LC	Ornamental Commercial	Herbivore	Harmless
		7.	<i>Bangana dero</i> (Hamilton, 1822)	Khabak	LC	Ornamental Commercial	Carnivore	Harmless
		8.	<i>Catla catla</i> (Hamilton, 1822)	Catla, Bao	LC	Commercial Aquaculture	Herbivore	Harmless
		9.	<i>Cirrhinus mrigala</i> (Hamilton, 1822)	Mrigal	LC	Commercial Aquaculture	Herbivore	Harmless
		10.	<i>Ctenopharyngodon idella</i> (Valenciennes, 1844)	Grass carp, Napi chabi	NE	Commercial Aquaculture	Omnivore	Potential pest
		11.	<i>Cyprinus carpio</i> Linnaeus, 1758	Puklaobi	VU	Commercial Aquaculture	Herbivore	Potential pest
		12.	<i>Labeo rohita</i> (Hamilton, 1822)	Rou	LC	Commercial Aquaculture	Herbivore	Harmless
		13.	<i>Osteobrama belangeri</i> (Valenciennes, 1844)	Pengba	NT	Commercial Aquaculture	Herbivore	Harmless
		14.	<i>Puntius sophore</i> (Hamilton, 1822)	Phabou nga	LC	Ornamental Commercial	Herbivore	Harmless

Continue.....

		15.	<i>Pethia manipurensis</i> (Menon, Rema Devi and Vishwanath, 2000)	Phabou nga	EN	Ornamental Commercial	Herbivore	Harmless
		16.	<i>Barbonymus gonionotus</i> (Bleeker, 1849)	Japan puthi	LC	Commercial Aquaculture	Herbivore	Harmless
		17.	<i>Puntius meingangbi</i> (Arunkumar & Tombi Singh)	Phabou nga	LC	Ornamental Commercial	Herbivore	Harmless
		18.	<i>Puntius chola</i> (Hamilton, 1822)	Phabou nga	LC	Ornamental Commercial	Herbivore	Harmless
		19.	<i>Semiplotus manipurensis</i> Vishwanath and Kosygin, 2000	Ngakoi	DD	Ornamental Commercial	Herbivore	Harmless
	Cyprinidae	20.	<i>Psilorhynchus balitora</i> (Hamilton, 1822)	Matu nanbi	LC	Ornamental Commercial	Omnivore	Harmless
	Cobitidae	21.	<i>Syncrossus berdmorei</i> Blyth, 1860	Sareng khoibi	NT	Ornamental Commercial	Omnivore	Harmless
		22.	<i>Lepidocephalichthys guntea</i> (Hamilton, 1822)	Ngakijou	LC	Ornamental Commercial	Carnivore	Harmless
		23.	<i>Lepidocephalichthys irrorata</i> (Hamilton-Buchanan)	Nganap nakuppi	LC	Ornamental Commercial	Carnivore	Harmless
Cypriniformes	Cobitidae	24.	<i>Schistura sikmaiensis</i> (Hora, 1921)	Sekmai nga	LC	Ornamental Commercial	Carnivore	Harmless
Perciformes	Chandidae	25.	<i>Chanda nama</i> Hamilton, 1822	Ngamhai	LC	Ornamental Commercial	Carnivore	Harmless
		26.	<i>Parambassis ranga</i> (Hamilton, 1822)	Ngamhai	LC	Ornamental Commercial	Carnivore	Harmless
		27.	<i>Channa striata</i> (Bloch, 1793)	Ngamu porom	LC	Ornamental Commercial	Carnivore	Potential pest
		28.	<i>Channa orientalis</i> Bloch & Schneider, 1801	Meitei ngamu	NE	Ornamental Commercial	Carnivore	Harmless
	Chandidae	29.	<i>Channa punctatus</i> (Bloch, 1793)	Ngamu bogra	LC	Ornamental Commercial	Carnivore	Harmless
	Gobiidae	30.	<i>Glossogobius giuris</i> (Hamilton, 1822)	Nailon ngamu	LC	Ornamental Commercial	Carnivore	Harmless
	Cichlidae	31.	<i>Oreochromis mossambicus</i> (Peters, 1852)	Tunghanbi	NT	Commercial Aquaculture	Omnivore	Harmless
	Anabantidae	32.	<i>Anabas testudineus</i> (Bloch, 1792)	Ukabi	DD	Commercial Aquaculture	Omnivore	Harmless
	Belontidae	33.	<i>Trichogaster fasciata</i> Bloch and Schneider, 1801	Ngapemma	LC	Ornamental Commercial	Carnivore	Harmless
Perciformes	Belontidae	34.	<i>Trichogaster labiosa</i> Day, 1877	Pheteen	LC	Ornamental Commercial	Carnivore	Harmless
Siluriformes	Bagridae	35.	<i>Mystus bleekeri</i> (Day, 1877)	Ngasep	LC	Ornamental Commercial	Omnivore	Harmless
	Bagridae	36.	<i>Mystus cavasius</i> (Hamilton, 1822)	Ngasep	LC	Ornamental Commercial	Omnivore	Venomous
	Siluridae	37.	<i>Ompok bimaculatus</i> (Bloch, 1794)	Ngaten	NT	Ornamental Commercial	Omnivore	Harmless
		38.	<i>Wallago attu</i> (Bloch & Schneider, 1801)	Sareng	NT	Commercial Aquaculture	Carnivore	Traumagenic
	Claridae	39.	<i>Clarias batrachus</i> (Linnaeus, 1758)	Ngakra	LC	Commercial Aquaculture	Carnivore	Potential pest
	Heteropneustidae	40.	<i>Heteropneustes fossilis</i> (Bloch, 1794)	Ngachik	LC	Commercial Aquaculture	Carnivore	Traumagenic
Synbranchiformes	Synbranchidae	41.	<i>Monopterus albus</i> (Zuiew, 1793)	Ngaproom	LC	Commercial Aquaculture	Carnivore	Harmless
Synbranchiformes	Mastacembelidae	42.	<i>Mastacembelus armatus</i> (Lacepede, 1800)	Ngartil	LC	Ornamental Commercial	Omnivore	Harmless

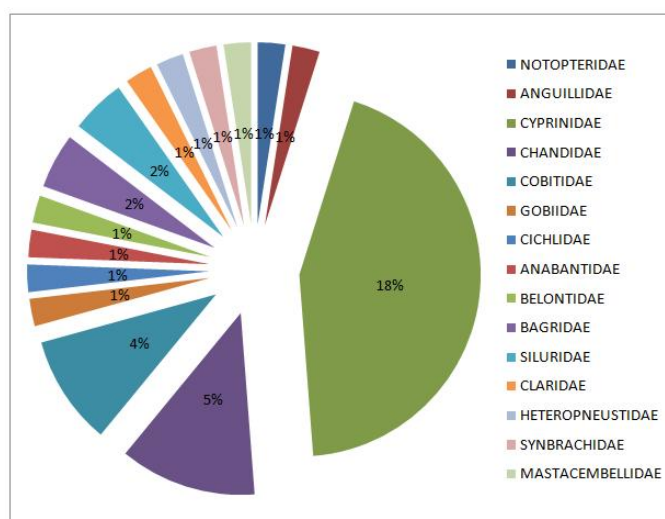


Figure 1. Percentage representation of species at Family level in Ultra Lake (March-September 2014)

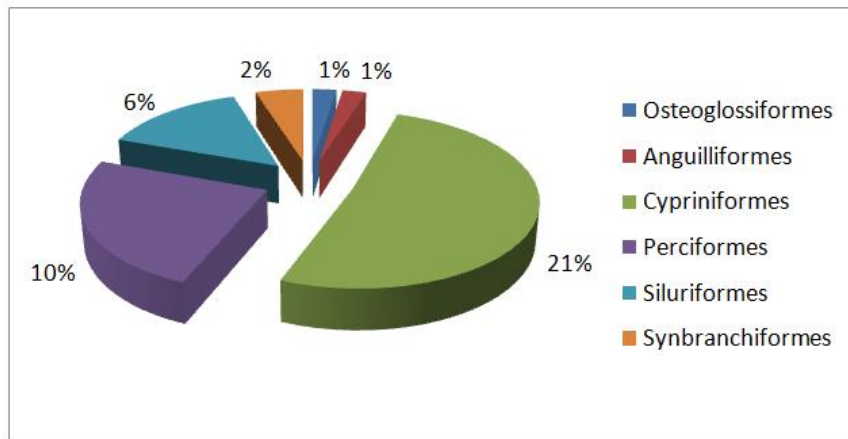


Figure 2. Percentage representation of species at Order level in Ultra Lake (March-September 2014)

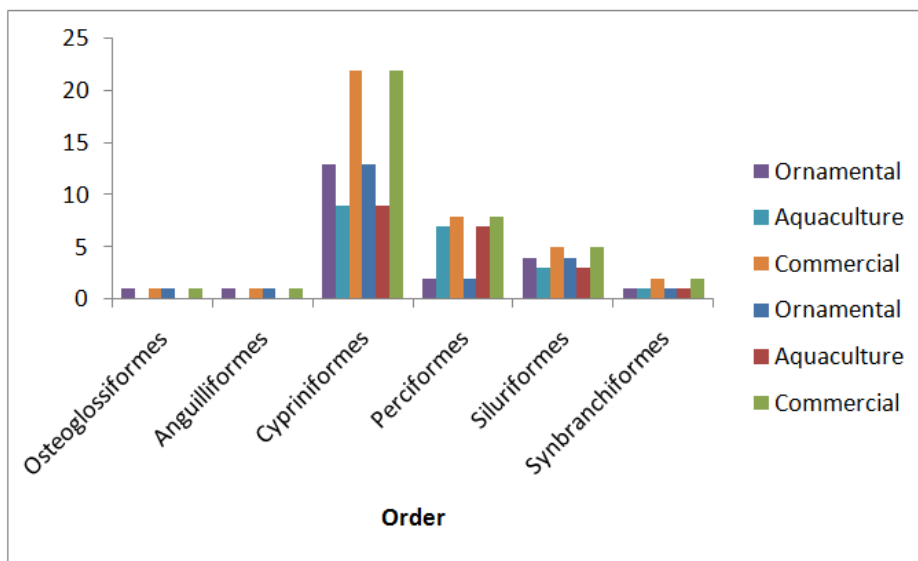


Figure 3. Percentage representation of species use by local fisherman at Order level in Ultra Lake (March-September 2014)

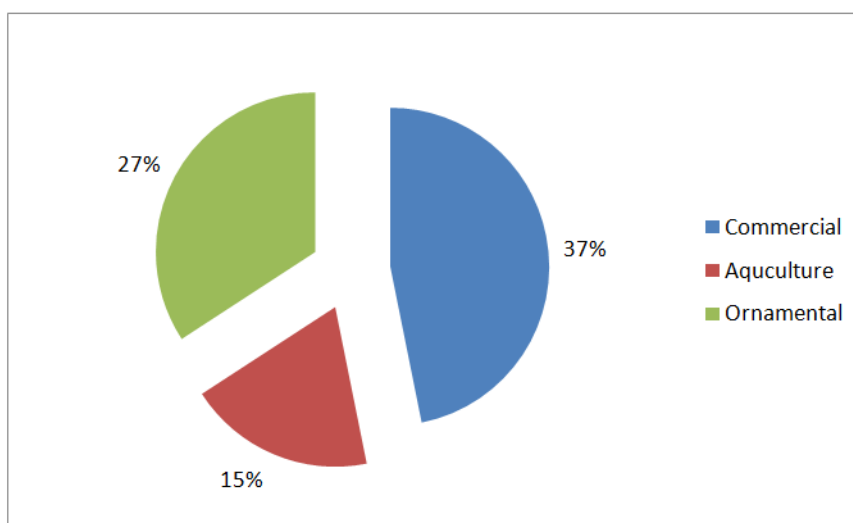


Figure 4. Percentage representation of species having Aquaculture, Commercial and ornamental value in the exploited fishery Ultra Lake March-September 2014

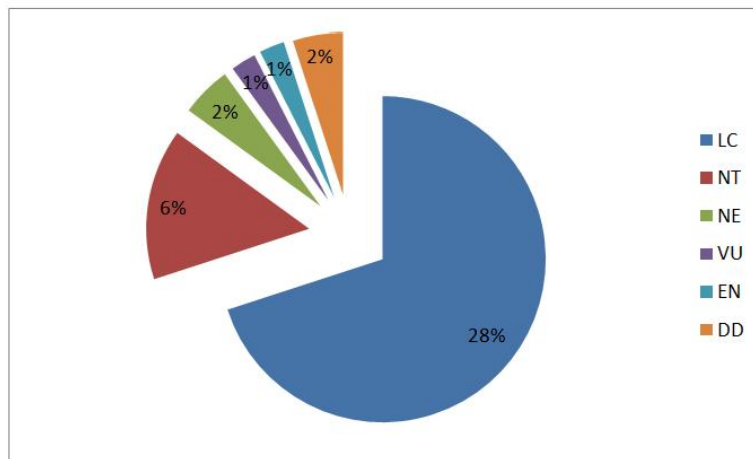
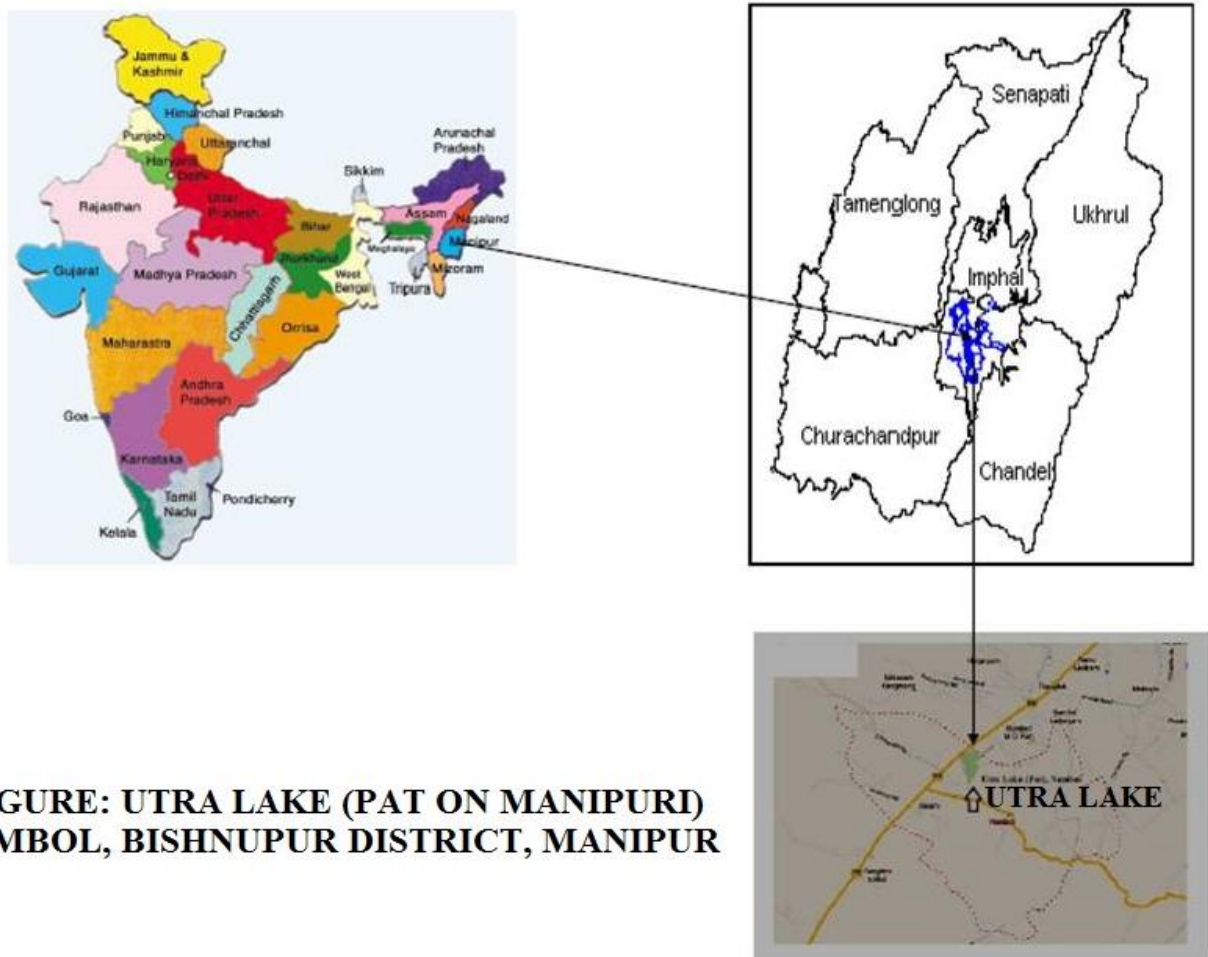


Figure 5. Biodiversity assessments of fish species in the Utra Lake (March-September 2014)



**FIGURE: UTRA LAKE (PAT ON MANIPURI) NAMBOL, BISHNUPUR DISTRICT, MANIPUR**

Figure 6. The study site i.e. Utra Lake, Nambol Bishnupur District, Manipur

The present investigation on Utra Lake indicated that the water qualities were within the permissible limits for fish and fishery practices, diversity of fish is quite rich and this study site had lost of potential for further study. (Table 1 Show the list of fish species available in Utra Lake). Figure 1 & 2 shows respectively the family-wise distribution of fish species and

order-wise distribution. Figure 3 & 4 shows details study on representation of species use by local fisherman at Order level in Utra Lake (March-September 2014) and representation of species having Aquaculture, Commercial and ornamental value in the exploited fishery Utra Lake March-September 2014.

Figure 5 highlights the IUCN category of assessments of fish species in the Utra Lake (March-September 2014).

### Acknowledgement

The authors are thankful to Principle, Thambal Marik College, Oinam for giving laboratory facilities and to the UGC, New Delhi for granting UGC fellowship to the First and Second author.

### REFERENCES

- Ahirrao, S.D. and Mane A.S. 2000. The diversity of ichthyofauna, taxonomy and fisheries from fresh waters of Parbhani District, Maharashtra State *J. Aqua.Biol.*, 15(1&2):40-43.
- Day, F. 1889. The fauna of British India including Ceylon and Burma. The Fishes, vol. I, pp. xviii+548, Vol. II, pp. xiv+509.
- Day, F. 1967. The Fishes of India vol. I and 2 Jagamander agencies New Delhi.
- Day, F., 1878. The fishes of India being a Natural History of The Fishes Known to Inhabit the Seas and Freshwater of India, *Burma and Ceylon*, vols. I & II, pp. xx+778, pls. cxiv
- Dr. C.B.L. Srivastava 2004. A Text Book of Fisheries Science and Indian Fisheries. Kitab Mahal, Allahabad, India: ISBN: 81-225-0029-3.
- Economic Survey of Manipur, Directorate of Economic and Statistics Government of Manipur, Imphal, 2007-08, 278.
- Gurumayum, S.D., Arun, G. and Nandeesh, M.C. 2006. Women participation in fisheries activities in Manipur Valley in India with traditional fish based beliefs and customs, In: Global symposium on Gender and Fisheries, edited by P S Choo, SJ Hall and MJ Willams, (*World Fish Centre, Penang*), 149-158.
- Hitesh Das, Dr. Amalash Dutta, 2012. Ichthyofaunal Diversity from Pagladia river of Assam, Volume 1 Number 1. *The Clarion*, ISSN: 2277-1967. 56-64pp.
- Jayaram, K.C. 1981. The freshwater Fishes of India, Pakistan, Bangladesh, Burma and Sri Lanka *Zoological Survey of India*. Calcutta.
- Jayaram, K.C. 2010. The freshwater fishes of the Indian region, Narendra Publishing House, Delhi, India, India. 551pp.
- Joychandra Singh, M. 1998. Limnological studies of Pumlun Lake-A major freshwater of Manipur *Ph.D. Thesis Manipur University*, 177pp.
- Manab Kumar Saha, Bidhan, C. and Patra, 2013. Present Status of Ichthyofaunal Diversity of Damodar River at Burdwan District, West Bengal, India. Volume 3.Issue 6. ISSN 2250-3153. *International Journal of Scientific and Research Publications*, 11pp.
- Mishra, K.S. 1962. An aid to the identification of the commercial fishes of India and Pakistan. *Records of the Indian Museum* 57 (1-4), p. 320.
- Ngasepam Romen Singh, Das, B. K., Shomorendra, M. and Kar, D. 2013. Fish diversity of Pumlun Lake in Manipur with a note on traditional fish catching devices, *Indian Journal of Applied Research*, Vol. 3, No. 10, 46-48pp.
- Shendge, A.N., B. A. Pawar, and A. K. Pandarkar, 2013, Fish Diversity of Tarangwadi Lake in Pune. *Uttar Pradesh J. Zool.*, 33(2): 197-199.
- Talwar, P. K. and Jhingran, A. G. 1991. Inland fishes of India and Adjacent Countries, Vol. 1 & 2, *Oxford and IBH Publishing Co*, Pvt. Ltd. New Delhi, India. 1158pp.
- Vijaykumar, K., Vijaylaxmi, C. and Parveen, Z. 2008. Ichthyofaunal diversity of Kagina River in Gulbarga district of Karnataka. *The Ecoscan.*, 2 (2): 161 – 163.
- Vishwanath, W. 2002. Fishes of North East India- A Guide to Species Identification. Manipur: National Agricultural Technology Project. Manipur University.

\*\*\*\*\*